

Photonics and Optoelectronics: Photonics, the science and technology of generating, manipulating, and detecting photons, underpins numerous modern technologies, including lasers, fiber optics, and photonic integrated circuits. Optoelectronic devices harness the interaction between light and electronic signals for applications ranging from telecommunications and data storage to biomedical imaging and solar energy conversion. Advancements in nanophotonics and plasmonics enable the miniaturization of photonic devices and enhance their performance characteristics, opening up new possibilities for high-speed data transmission, ultra-sensitive sensors, and quantum information processing.